

NOTES ON ENOCHRUS AND CYMBIODYTA  
FROM THE PACIFIC NORTHWEST  
(COLEOPTERA: HYDROPHILIDAE)<sup>1</sup>

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The following information is presented in order to make the names of the new species and the synonymy for certain older species available for use in the section on the Hydrophilidae in the forthcoming Part V of Dr. M. H. Hatch's *Beetles of the Pacific Northwest*.

Thanks are due to the following individuals for the loan of material of the new species for study. The abbreviations in parentheses are those used after the locality listings to indicate the site of deposition of the type material. This is generally equivalent to the original source from which it was borrowed. The author's collection is referred to as (DM). Mr. H. S. Dybas, Chicago Natural History Museum (CNHM); Mr. J. J. Davis, Hanford, Washington (JJD); Mr. Joe Schuh, Klamath Falls, Oregon (JS); Mr. Joseph Capizzi, Oregon Department of Agriculture (ODA); Mr. Jack Lattin, Oregon State University (OSU); Mr. S. G. Jewett, Portland, Oregon (SGJ); Dr. M. H. Hatch, University of Washington (UW).

Dr. P. J. Darlington of the Museum of Comparative Zoology, Harvard University, Mr. J. A. G. Rehn of the Philadelphia Academy of Sciences, and Mr. W. J. Brown of the Canadian National Collection have been most kind in allowing me to examine types. Mr. Ralph W. Gundersen of the University of Minnesota, and Mr. Hugh B. Leech of the California Academy of Sciences have read the manuscript. Dr. M. H. Hatch has aided in many ways with the portions of the work completed while I was at the University of Washington. The drawings are by Mrs. Helen Houk, of the University of Washington.

THE GENUS ENOCHRUS

*Enochrus (Enochrus) carinatus* (LeConte)

*Philhydrus carinatus* LeConte 1855:370.

*P. fucatus* Horn 1873:127; 1890:242-243. [NEW SYNONYMY.]

*Enochrus fucatus*: Winters 1927:19. Leech and Chandler 1956:345.

For some time, *Enochrus carinatus* (LeC.) and *E. fucatus* (Horn) have been thought to be separable by the coloration of the pronotum and elytra. Winters (1927) stated that *carinatus* is uniformly dark dorsally, except for the front angles of the pronotum, while *fucatus* has the pronotum and elytra decidedly paler than the head. Leech and Chandler

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(1956) repeated this distinction. However, I have examined the two cotypes of *carinatus* LeC. in the Museum of Comparative Zoology, Harvard, the type of *fucatus* Horn in the same institution, and the type of *fucatus* in the Philadelphia Academy of Sciences; all four of these specimens have the elytra and pronotum decidedly paler than the head. The elytra and pronotum vary from light reddish brown to nearly yellow in these four specimens, but all appear to me to belong to one species. Thus *fucatus* Horn is a synonym of *carinatus* LeC. The types of *carinatus* LeC. were collected in California and those of *fucatus* Horn were collected in Utah.

This leaves the form which Winters called *carinatus* LeC. without a name, and it is given the name *piceus* Miller, new species, below. The problem, however, goes further. It is difficult to decide whether some specimens are *carinatus* LeC. or *piceus* Miller, new species. This is particularly true of some material which I have seen from Oregon, where both forms are present. It is possible that they are variants of a single species, though the presence of *piceus* throughout most of the range of *carinatus* argues against considering the forms to be subspecies. On the other hand, the very small amount of material of *carinatus* that I have seen from the southwestern United States is quite variable in color, punctuation, and the form of the prosternal carina, so that it is possible that more than one species is represented in that area. More study, particularly of these southern forms, is needed.

*Enochrus (Enochrus) piceus* Miller, NEW SPECIES

*Philhydrus carinatus*: Horn 1873:126-127; 1890:242-244 (*nec* LeConte).

*Enochrus carinatus*: Winters (*nec* LeConte) 1927:19. Leech and Chandler 1956:345.

This is the darker of the two forms discussed above; the dorsal surface is nearly uniformly dark and the front angles of the pronotum are pale. As the synonymy above leaves this form without a name it is given one here, and type material is designated.

HOLOTYPE: Male, Wilbur, Washington, Aug. 24, 1932 (UW).

ALLOTYPE: Female, same data as holotype (UW).

PARATYPES: WASHINGTON: *Benton Co.*: 1, Hanford (JJD). *Douglas Co.*: 2, Grand Coulee (Dry Falls) (UW). *King Co.*: 1, Snoqualmie (UW). *Kittitas Co.*: 1, Cle Elum (UW); 1 Kittitas (UW). *Lincoln Co.*: 10, Wilbur (8 UW, 2 DM). *Pacific Co.*: 1, Nasel River (UW). *Spokane Co.*: 1, Spokane (UW). *Walla Walla Co.*: 1, Wallula (UW). IDAHO: *Franklin Co.*: 1, Bear River Canyon (UW). *Canyon Co.*: 4, Lowell Lake (UW). OREGON: *Baker Co.*: 2, Durkee (Powell Creek) (UW); 2, Snake River (Farewell Bend) (UW). *Benton Co.*: 1, Alsea Mountain (OSU); 1, Corvallis (OSU). *Clackamas Co.*: 14, Austin Hot Springs (10 SGJ, 2 UW, 2 DM). *Coos Co.*: 1, Myrtlewood Camp (Myrtle Creek) (OSU). *Curry Co.*: 6, Brookings (Myrtle Grove, Chetco River) (3 OSU, 2 UW, 1 DM); 23, Pistol River (9 CNHM, 11 UW, 2 DM, 1 OSU); 3, Port Orford (2 CNHM, 1 UW). *Deschutes Co.*: 1, Sisters (OSU). *Douglas Co.*: 3, Roseburg (UW). *Jackson Co.*: 2, Dead Indian Springs (JS). *Jefferson Co.*: 1,



Spring Creek (OSU). *Josephine Co.*: 2, Wolf Creek (UW). *Linn Co.*: 1, Santiam River (Lebanon) (SGJ). *Umatilla Co.*: 2, Echo (UW); 1, Free-water (OSU). *Wallowa Co.*: 1, Wallowa River (UW). CALIFORNIA: *Los Angeles Co.*: 2, Taipa Park (Santa Monica Mountains) (DM). *San Diego Co.*: 2, Vista (DM). *Santa Cruz Co.*: 4, Ben Lomond (DM). *Siskiyou Co.*: 1, Hilts (Cottonwood Creek) (SGJ).

*Enochrus (Lumetus) collinus* Brown

*Enochrus collinus* Brown 1931:118.

This species is not common and is very similar to *E. conjunctus* (Fall) and related species. The material that I have seen from British Columbia (Copper Mt. and Quesnel) and Idaho (Malad City, Little Malad River) agrees with the type, in the Canadian National Collection. *Collinus* is generally somewhat darker than *conjunctus*, and males of the two species can be separated on the structural characters given in the key to follow.

*Enochrus (Lumetus) conjunctus* (Fall)

*Philhydrus conjunctus* Fall 1901:217.

*Enochrus conjunctus*: Brues 1932:267. Leech and Chandler 1956:345. Malkin 1958:34.

The only difference between *conjunctus*, *horni* Leech, and a form labeled in some collections "*lividus* Walker" is in color. The male genitalia and all other structural characters are identical in all three forms. Since intergrades exist, it is entirely possible that all three are color variants of a single species. In any case the name *lividus* Walker is not usable because it is based on a misidentification. Walker (1866:310-319) wrongly identified material from British Columbia as *Philhydrus lividus* Forster, a European species. The latter is now the type of the genus *Helochares* Mulsant.

An extensive study of material from the entire range of the complex should be undertaken to determine how many species are involved. Here, I will tentatively consider that there are two. *Conjunctus* Fall should include those specimens which are primarily dark dorsally with the sides of the head and the pronotum variably paler; *horni* Leech should include those specimens which are primarily yellowish dorsally with the base of the head and the pronotal disc generally dark, but sometimes pale. Walker's identification of *lividus* was probably based on material of this latter group in which the pronotum was entirely pale.

*Enochrus (Lumetus) diffusus* (LeConte)

*Philhydrus diffusus* LeConte 1855:371 (in part).

*Enochrus diffusus*: Leech 1948:450; 1950:254-256. Leech and Chandler 1956:345.

Leech (1950:254-256) was the first to point out the distinguishing characters of the metafemora and clypeus of this species. The male gen-

italia are also distinctive, having an elongate supporting strut for the median lobe as noted in the key below. This strut is shorter in the *conjunctus-horni* group. The Museum of Comparative Zoology, Harvard, contains a series of four cotypes of *diffusus* LeC. Only the fourth of these agrees with *diffusus* as now recognized, while the other three belong to an unknown species, perhaps the "livid" form of *horni* Leech as recognized here (see discussion under *E. (L.) conjunctus* (Fall)). For this reason I have designated cotype #4 as the lectotype for the species *diffusus* LeC.

*Enochrus (Methydrus) lacustris* (LeConte)

*Philhydrus lacustris* LeConte 1855:369. Fall 1924:87.

The material which I have tentatively referred to this species is from bog lakes near Seattle, Washington, particularly from Chase Lake. There does not appear to be any appreciable difference between this material and LeConte's type (in the Museum of Comparative Zoology, Harvard), but *lacustris* is a member of a difficult complex which is in need of additional study before identifications can be made with certainty.

KEY TO THE ENOCHRUS OF THE PACIFIC COAST

From Leech and Chandler (1956:345) with additions and alterations. This key includes all known species of *Enochrus* from California, Oregon, Idaho, Washington, and British Columbia.

1. Fifth abdominal sternite with a small apical emargination, from which projects a differentiated fringe of golden cilia----- 2  
Fifth abdominal sternite entire apically, not emarginate, without differentiated fringe of flat cilia (subgenus *Lumetus* Zaitz.)----- 9
2. Last two segments of maxillary palpi of equal length, or last longer than penultimate (subgenus *Enochrus* s. str.)----- 3  
Last segment of maxillary palpi shorter than penultimate (subgenus *Methydrus* Rey) 5
3. Head luteous in front of eyes, elsewhere black; prosternum not carinate; smaller species, 3.5-4 mm. long; pronotum black, sides and parts of anterior and posterior margins luteous; California to Oregon----- **CUSPIDATUS** (LeC.) 4  
Head entirely black, or vaguely narrowly rufopiceous in front of eyes; prosternum with a low poorly defined median longitudinal carina; larger species, 4-5 mm. long 4
4. Dorsal surface black to dark reddish brown, front angles of pronotum usually paler; southwestern U. S. to Washington, Idaho----- **PICEUS** Miller  
Head black dorsally, pronotum and elytra reddish brown to yellow; Oregon and southwestern Idaho to southwest U. S.----- **CARINATUS** (LeC.)
5. Prosternum not carinate----- 6  
Prosternum carinate; smaller species, 2.75-3.75 mm. long; mesosternal protuberance laminiform, acutely prominent anteriorly, not at all obscured by vestiture ----- 7
6. Smaller species, 3.0-3.7 mm. long, mesosternal protuberance quite low, lamelliform, glabrous, not toothed; emargination of fifth abdominal sternite small, acute; western Washington, bog lakes----- **? LACUSTRIS** (LeC.)  
Larger species, 4.5-5.8 mm. long; mesosternal carina higher, hairy, bearing low, rounded teeth obscured by the pubescence; emargination of fifth abdominal sternite fairly large, rounded; California to British Columbia----- **CALIFORNICUS** (Horn)
7. Pronotum piceous on disc----- 8  
Pronotum entirely testaceous; elytra polished, minutely punctate, except for several more or less evident longitudinal series of coarser punctures; southwestern U. S. ----- **PECTORALIS** (LeC.)



8. Elytra extremely finely, sparsely punctate, except for serial punctures which stand out contrastingly; pronotum usually broadly piceous, elytra tinged with piceous; narrower species; San Diego County, Calif.-----**CRISTATUS** (LeC.)  
Elytra rather densely, moderately coarsely punctate, serial punctures not conspicuous; pronotum usually piceous only at middle of disc, elytra not tinged with piceous; broader species; California to Oregon to Utah-----**OBTUSIUSCULUS** (Mots.)
9. Dorsal surface dark reddish brown to black, elytra and pronotal disc usually equally dark, head before the eyes and edges of pronotum often paler----- 10  
Dorsal surface yellow to dark brown except for black areas on head and sometimes on pronotal disc ----- 11
10. Dorsal surface usually black, pronotum at most narrowly and indistinctly paler at sides, head not pale before eyes; hind angles of pronotum sharp, nearly rectangular; males with tooth of outer protarsal claw large but not so strongly everted, extending only about half way to tip of claw; external supporting strut of median lobe of aedeagus in ventral view extending beyond apex of median lobe a distance at least equal to width of median lobe; British Columbia, Idaho-----**COLLINUS** Brown  
Dorsal surface dark reddish brown, head often pale before eyes and pronotum narrowly to broadly pale at sides; hind angles of pronotum more broadly rounded; males with tooth of outer protarsal claw larger and fairly strongly everted, reaching about two-thirds of the way to tip of claw; external supporting strut of median lobe of aedeagus extending only slightly if at all beyond apex of median lobe; California to British Columbia-----**CONJUNCTUS** (Fall)
11. Front margin of clypeus evenly arcuate-emarginate, without trace of a secondary emargination at middle; species occurring in brackish or saline water along sea-coast, near lower Colorado River, and in Death Valley, Calif.----- 12  
Emargination of front of clypeus with a secondary emargination at middle, exposing a preclypeus ----- 13
12. Elytra more coarsely punctate; salt marsh and saline pools, coast of California and up estuary of Colorado River-----**HAMILTONI PACIFICUS** Leech  
Elytra more finely punctate; saline waters, Death Valley, Calif. **HAMILTONI PYRETUS** Leech
13. Smaller species, 3.5-4.5 mm. long; hind edge of hind femora simple; Central Valley of California -----**? LATIUSCULUS** (Mots.)  
Larger species, 4.4-6.5 mm. long----- 14
14. Secondary emargination at front of clypeus arcuate, exposing a preclypeus; hind edge of hind femora simple; dorsal surface pale to dark brown, base of head black and pronotal disc completely pale to strongly black; external supporting strut of median lobe of aedeagus extending little if at all beyond apex of median lobe; southern British Columbia to Oregon, Idaho-----**HORNI** Leech  
Secondary emargination at front of clypeus truncate, exposing a preclypeus; hind edge of hind femora of male with a slightly raised and pronounced area at middle; dorsal surface yellow to pale brown, at most slightly darkened (never black) on pronotal disc and base of head; external supporting strut of median lobe of aedeagus extending beyond apex of median lobe a distance equal to nearly twice width of median lobe in ventral view; southern British Columbia to California, east of Cascade Range -----**DIFFUSUS** (LeC.)

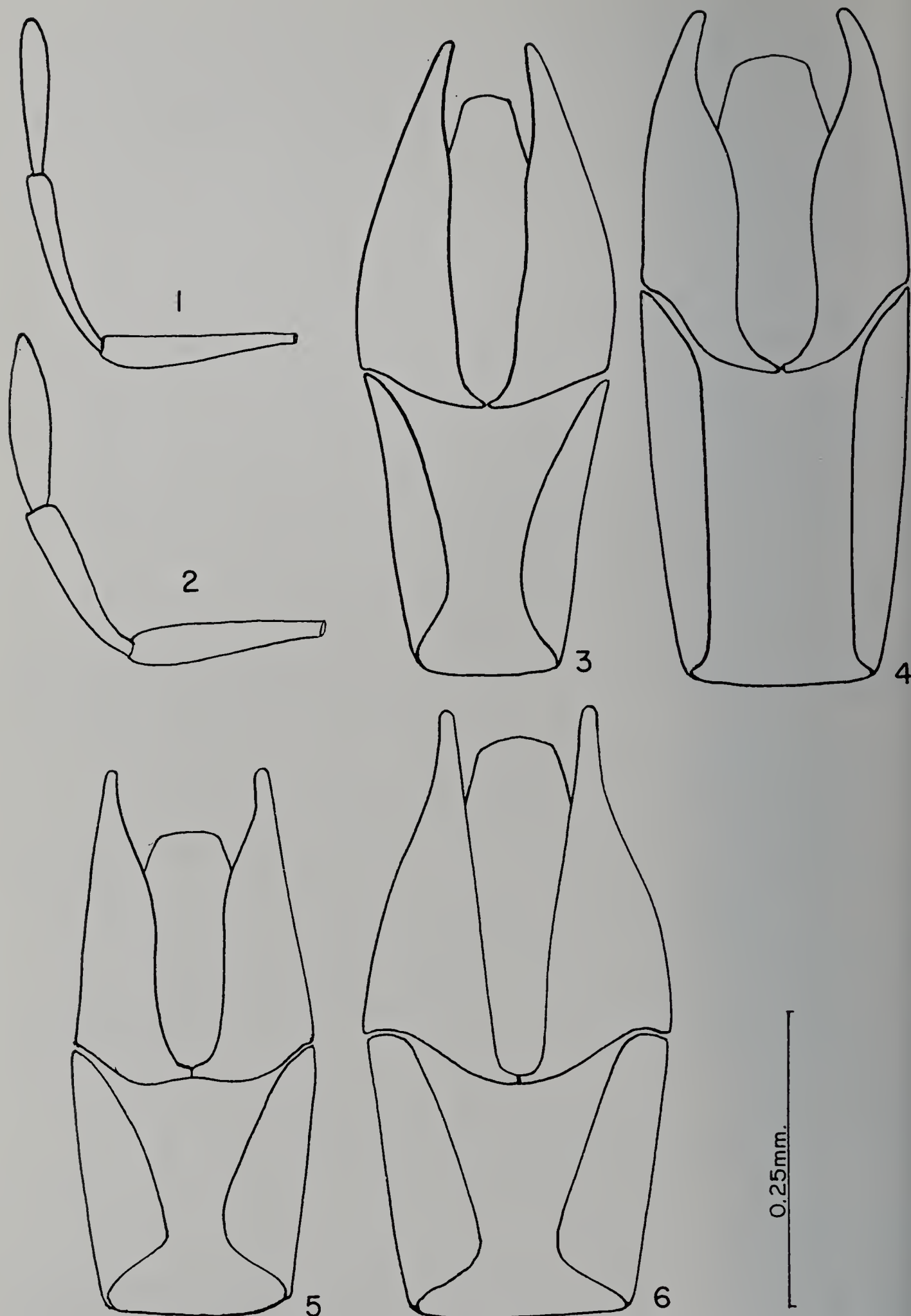
## THE GENUS CYMBIODYTA

### *Cymbiodyta acuminata* Fall

(FIGS. 1, 3)

*Cymbiodyta acuminata* Fall 1924:87.

The type of this species is missing from the Fall Collection in the Museum of Comparative Zoology, Harvard, but material from British Columbia (Agassiz; Copper Mt.; Vernon; and Wynndel) and Washington (Dry Falls, Grand Coulee; Millersylvania State Pk.) agrees with topotypical specimens in that collection.



FIGURES 1, 3, *Cymbiodyta acuminata* Fall. 1—Maxillary palpus. 3—Aedeagus, dorsal view. FIGURES 2, 4, *Cymbiodyta leechi* n. sp. 2—Maxillary palpus. 4—Aedeagus, dorsal view. FIGURE 5, *Cymbiodyta vindicata* Fall, Aedeagus, dorsal view. FIGURE 6, *Cymbiodyta hatchi* n. sp., Aedeagus, dorsal view.

*Cymbiodyta leechi* Miller, NEW SPECIES

(FIGS. 2, 4)

MALE: Length 4.5-5.1 mm.; form elongate oval; dorsal surface entirely finely and very thickly punctate, about evenly so on all areas, and shining black except the anterior margin of the labrum, the anterior (very narrowly) and lateral margins of the pronotum, and the elytral margins and apex which are dark yellowish brown; pronotum with a very irregular row of larger punctures extending inward from the margin on each side and a more regular row posterior to this on each side, and the elytra with a very few larger punctures in very inexact longitudinal rows; side margins of the pronotum slightly bowed outwards, the front corners very broadly and evenly rounded, the hind corners more sharply rounded, forming an obtuse angle; venter black, except the meso- and metacoxae and trochanters, all the legs from the tips of the femora apically, and the antennal club, which are dark yellowish brown, the palpi and the remainder of the antennae lighter and more yellowish; aedeagus in dorsal view with parameres broad, their tips bent toward each other (i.e. outer margin of each paramere a smooth curve, but inner margins bending sharply towards each other near apex); mesosternal ridge bearing a large median tooth as in *C. acuminata* Fall.

FEMALE: Externally identical to male.

HOLOTYPE: Male, Chase Lake, Snohomish Co., Washington, May 5, 1949, M. H. Hatch (UW).

ALLOTYPE: Female, same data as holotype (UW).

PARATYPES: WASHINGTON: *King Co.*: 1, Echo Lake (UW); 17, Juanita (15 UW, 2 DM); 2, Lake Marie (UW); 1 Renton (Cedar River) (UW); 4, Seattle (UW); 1, Seattle (Green Lake) (UW); 3, Seattle (Lake Washington) (UW). *Snohomish Co.*: 64, Chase Lake (60 UW, 4 DM); 6, Scribner Lake (5 UW, 1 DM). *Thurston Co.*: 1, Lost Lake (UW); 2, Tumwater (UW). OREGON: *Jackson Co.*: 1, Dead Indian Soda Springs (ODA). *Klamath Co.*: 3, Mare's Egg Spring (2 JS, 1 DM). *Yamhill Co.*: 1, Dayton (UW).

This species is quite close to *C. acuminata* Fall, which is the only other North American *Cymbiodyta* with a strongly developed tooth on the mesosternum. *Leechi* differs from *acuminata* in the following ways: hind angles of pronotum more obtuse and sides of pronotum more arcuate; maxillary palpi more robust and usually more yellowish; mesosternal tooth slightly shorter; parameres convergent at the tips.

It gives me great pleasure to name this species in honor of Mr. Hugh B. Leech, of the California Academy of Sciences. Mr. Leech's many publications on the Hydrophilidae have added greatly to our knowledge of the family, and he has been of great help to me in my work on the north-western species.

*Cymbiodyta vindicata* Fall

(FIG. 5)

*Cymbiodyta vindicata* Fall 1924:86-87.

As with *C. acuminata* Fall, the type of this species is missing from the Fall Collection in the Museum of Comparative Zoology, Harvard. Topotypical specimens in that collection agree with material from British Columbia (several localities) and Washington (Lake Thomas, Snohomish Co.)



*Cymbiodyta hatchi* Miller, NEW SPECIES  
(FIG. 6)

MALE: Length 5.1 mm., form oval; head black; pronotum and elytra dark brown, with the pronotum narrowly paler laterally and the elytra narrowly paler laterally and much more broadly and diffusely paler apically; entire dorsum finely and thickly punctate; in addition to the fine punctation with two rows of coarser punctures on each side of the pronotum, slanting postero-laterally and very irregular and incomplete, and occasional coarser punctures on the elytra, especially laterally where they are very irregular in arrangement, the few coarse punctures of the disc arranged in longitudinal series but so far apart that the series are not evident; venter largely black, the legs apical to the femoral pubescence brown, the palpi very dark brown; mesosternal ridge transverse, not toothed; aedeagus in dorsal view with the inner margin of each paramere straight, the outer margin curving gradually inward from the base to near the apex and then bent outward to nearly parallel the inner margin so that the tip is elongate along its inner margin, the extreme apex of the paramere bluntly rounded.

FEMALE: Unknown.

HOLOTYPE: Male, 13 mi. N.E. Bly, edge Deming Cr., Klamath Co., Oregon, Sept. 16, 1960, Joe Schuh (JS).

The holotype is the only known specimen. This species is named in honor of Dr. M. H. Hatch, of the University of Washington, who originally stimulated my interest in the Hydrophilidae and who has aided me immeasurably during the course of my work with the northwestern species. *Hatchi* is very close to *C. vindicata* Fall and the eastern *C. fimbriata* (Melsh.), but can be distinguished from either by its prolonged apex of the parameres. The dark brown palpi of the holotype may also prove to be diagnostic when other specimens are known.

### KEY TO THE CYMBIODYTA OF THE PACIFIC COAST

From Leech and Chandler (1956:345) with additions and alterations. This key includes all known species of *Cymbiodyta* from California, Oregon, Idaho, Washington, and British Columbia.

1. Elytra with striae or serial large punctures evident in at least the apical quarter; mesosternal protuberance entirely transverse, never with a tooth----- 2  
Elytra with no striae (except the sutural ones) or evident rows of coarse punctures; pronotum and elytra black to dark reddish brown discally, pale marginally----- 5
2. Elytra with sutural striae at least in apical half, but elsewhere at most with serial punctures not impressed as striae; head entirely black----- 3  
Elytra with distinct striae in addition to sutural; head pale before eyes; form broad; all rows of punctures entire, including scutellar row; California -----  
-----PUNCTATOSTRIATUS (Horn)
3. Metafemora pubescent in slightly less than basal two-thirds; maxillary palpi short and stout, yellow; dorsal surface black to dark reddish brown, the margins paler; elytra with serial punctures forming at least three nearly complete rows laterally, the discal rows complete only in about the apical quarter; California to British Columbia -----DORSALIS (Mots.)  
Metafemora pubescent in basal three-quarters; maxillary palpi longer and more slender; elytra with lateral series of punctures usually traceable to near base, but discal series traceable only near apex----- 4
4. Pronotum and elytra usually reddish brown to black, the margins paler; elytra with serial punctures more confused, not traceable as striae as far anteriorly as in the following species, the discal striae especially usually visible only at apex; maxillary palpi usually brownish; California to British Columbia----- PACIFICA Leech



- Pronotum and elytra usually yellowish brown to dark brown, disc of pronotum black; elytra with serial punctures somewhat more evident and less confused with larger punctures of intervals; maxillary palpi usually yellowish; California to Oregon --
- IMBELLIS (LeC.)
5. Mesosternal protuberance bearing a large median tooth----- 6
- Mesosternal protuberance without a large median tooth----- 7
6. Hind angles of pronotum nearly rectangular; sides of pronotum nearly straight in posterior three-quarters, bending in gradually in anterior quarter; maxillary palpi more slender, yellowish brown (fig. 1); mesosternal tooth longer; aedeagus with parameres nearly triangular in shape, not converging at tip, inner margin nearly straight (fig. 3); form slightly less robust; Washington, S. British Columbia -
- ACUMINATA Fall
- Hind angles of pronotum more obtuse, sides of pronotum more broadly arcuate; maxillary palpi more robust, yellow (fig. 2); mesosternal tooth slightly shorter; aedeagus with parameres bent slightly towards each other at tips, inner margin of each paramere strongly sinuate (fig. 4); form slightly more robust; Washington, Oregon -----LEECHI Miller
7. Smaller species, more parallel sided, length 3.4-4.0 mm.; palpi yellow, slender; aedeagus with outer margin of each paramere curving inward to about 2/7 of the distance from tip, then bent outward to parallel inner margin, so that parameres diverge from that point apically; British Columbia, Washington, Idaho -
- MINIMA Notman
8. Larger species, length over 4.4 mm.----- 8
8. Aedeagus with inner margin of each paramere sinuate but parameres not convergent at tips, outer margin straight to tip (fig. 5); mesosternal ridge lower; palpi yellow; British Columbia, Washington-----VINDICATA Fall
- Aedeagus with inner margin of each paramere straight, outer margin bent slightly outward near tip so that tip is slightly elongate (fig. 6); mesosternal ridge slightly higher; palpi brown; E. Oregon (Deming Cr.)-----HATCHI Miller

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## NOTICE

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